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ABSTRACT

This report describes the telecommunications systems currently available in Virginia to deliver educational materials and conduct administrative meetings and training in a cost effective manner. Examples are provided of how state agencies and institutions in Virginia are using each of the technologies and the future potential of each system is considered. Guidelines are provided for determining which distribution technology to use to achieve a given purpose. Specific technologies described are audio teleconferencing; radio; slow scan television; public television stations; microwave and Instructional Television Fixed Service; cable television; satellites; and fiber optics. Appended are a teleconferencing growth chart; Department of Information Technology and Council on Information Management legislation; a policy statement on the acquisition of services, equipment, and facilities; radio, public television, microwave and satellite coverage maps; a state satellite downlink map; and a directory of Virginia Cooperative Extension Service downlinks. A glossary of terms used in the report is also provided. (GL)

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VIRGINIA TELEMEDIA SYSTEMS for ADMINISTRATIVE, TRAINING and EDUCATIONAL USES

Telemedia Services Division

September 1988

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VIRGINIA TELEMEDIA SYSTEMS
for
ADMINISTRATIVE, TRAINING
and
EDUCATIONAL USES

Telemedia Services Division
September 1988

by

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Telemedia Services Division

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Introduction

Virginia state government has taken the lead in exploring ways in which to use various telecommunications systems to deliver educational materials and conduct administrative meetings and training in a cost effective manner.

This paper will describe some of the systems available now, cite examples of how state agencies and institutions are using these technologies, and look at what systems may be used by the Commonwealth in the future to deliver educational programming, training, and administrative teleconferences across Virginia, to the nation and even the world.

Role of the Department of Information Technology

The Department of Information Technology (DIT) is responsible for approving acquisition of and contracting for all telecommunications services and facilities on behalf of the Commonwealth. (See Code of Virginia, Chapter 35.2, Appendix B.)

Role of the Telemedia Services Division

The Telemedia Services Division assists all state agencies and institutions in the planning, procurement, and use of all types of educational technology. First and foremost, the Division plans for the efficient use of Commonwealth telemedia resources and implements telemedia facilities, systems, networks and capacities. The approval for state procurement of telemedia equipment and services is handled through this Division. The Division approves the rates and administers contracts between public broadcasting entities and state agencies and institutions and schedules all video network capacities on behalf of state agencies and institutions including the microwave network, ITFS, open broadcast, satellite uplinks and all audio bridge capacities.

The Division also promotes and coordinates state support for public broadcasting and provides staff suppport to the Virginia Public Telecommunications Board (VPTB). Designs for electronic classrooms and other special applications are provided as well as equipment consulting services. Audio and video teleconference promotion and access are provided and their cost effectiveness is demonstrated. The Division researches, plans, and promotes the use of new technologies within state government, associations, and groups within Virginia. All requests for FCC licensing of Commonwealth owned broadcast related facilities are approved and coordinated through the Division. [See Appendix D.]

As the need for audio and video capacities continues to increase, DIT will either provide the services required or continue to contract with the public television and radio stations, and others to provide the services needed.

The Telemedia Services Division and the Virginia Public Telecommunications Board will continue to promote the effective use of technology to assist state agencies and institutions in fulfilling their various missions.

AUDIO TECHNOLOGIES

Audio Teleconferencing

The Department of Information Technology operates the State Controlled Administrative Telephone System (SCATS). SCATS is a leased telecommunications network providing long distance telephone service to locations throughout the continental United States. The system allows Virginia state agencies and institutions to receive lower telephone rates for long distance calling because of the large volume of traffic.

As a part of this network, the DIT operates three audio teleconferencing "bridges." These bridges, located in Northern Virginia, Norfolk, and Richmond, allow automatic or operator-assisted telephone conferences with people at up to ninety-four (94) locations within or outside Virginia. The bridges accept calls from all telephones, not just SCATS network instruments. With conference units (microphones and speaker) at locations where there is more than one person, an even larger number of people may meet electronically.

When a conference is scheduled, participants call the bridge nearest them and the equipment automatically ties them together. No operator is required and the system is full-duplex, meaning natural conversation flow is possible.

Audio Teleconferencing Applications

State agencies and institutions are using the teleconferencing bridges thousands of times a year for administrative meetings and classes. The number of teleconferences arranged locally (e.g., three-way calling) and point-to-point calls with more than one person at each site cannot be calculated.

The Department of Transportation and the Department for the Visually Handicapped are two agencies which have instituted teleconferencing on a department-wide basis. Both installed conference units in each of their regional offices and central offices in Richmond to increase and improve communication within the agencies.

Some institutions use "audio plus" teleconferencing. One example is combining videotaped classes or slides and visuals sent ahead of time with live audio interaction during the class session. For example, the University of Virginia and VCU/MCV have offered audiology/speech pathology courses to students in Richmond, Fairfax, and Southwest Virginia in this manner. Also, Northern Virginia Community College offers music courses to three of its five campuses simultaneously via audio teleconferencing.

Potential Uses of Audio Teleconferencing

The Commonwealth could use audio only teleconferencing much more extensively than it does now. With a limited investment in equipment, agencies and institutions can have the flexibility to conduct cost-effective meetings or classes anywhere there is a telephone.

Radio

There are four Corporation for Public Broadcasting-qualified, non-commercial, FM radio stations licensed in Virginia. They are WHRO-FM in Norfolk, WCVE-FM in Richmond, WMRA-FM in Harrisonburg, and WVTF-FM in Roanoke. (See map, Appendix E.)

In addition to broadcast FM signals, the stations transmit "subcarrier" channels. These channels do not interfere with a station's main channel broadcasting signal and special receivers are required to pick up these transmissions.

Radio Applications

Radio is a seldom-used method of delivering formal educational materials in Virginia. However, Old Dominion University and WHRO-FM produced a radio course entitled "American Diplomacy" which was distributed nationally. In the mid-1970's, an award-winning course called "Virginia and the American Revolution" was broadcast several times in Richmond and was offered for credit by several institutions. The course was also aired by the Roanoke public radio station as a public service.

All of Virginia's public radio stations are currently using their subcarrier channels to distribute reading services for the blind and physically handicapped. The stations produce local programming and the Virginia Voice Network and other services deliver material to the FM stations via satellite, microwave and telephone lines for local transmission. Relatively inexpensive special receivers are required to hear the readings of daily papers and magazines as well as specialized programming unavailable from other sources.

Potential Uses of Radio

The main channel radio broadcasting signal could be used for formal instructional courses where appropriate to reach specific regional audiences. In addition, educational programming for the blind and physically handicapped could be delivered via the subcarrier service of each of the public radio stations.

With specialized equipment, this same subcarrier could also be used to deliver computer data to schools or state agencies for instructional or administrative purposes. This system is in the advanced experimental stage, and WHRO-FM is using it on a limited basis.

VIDEO TECHNOLOGIES

Slow Scan Television

This point to point or point to multipoint technology allows video to be sent over regular telephone lines. Movement is shown in "captured" still photographs that are built up over several seconds. Two way interaction is possible, but not required, and this technology can be combined with audio teleconferencing to provide visual support materials, including pictures of the instructor or person conducting a meeting.

Slow Scan Applications

Northern Virginia Community College (NVCC) is using slow scan television combined with audio teleconferencing to teach courses on its five campuses simultaneously. It also participated in an experimental course which included community colleges in the Richmond area and in far Southwest Virginia.

Slow scan television can be useful in providing visuals for meetings or classes requiring video support. One drawback is that some people find the time delay for building the still picture to be annoying. However, slow scan TV can be a cost-effective alternative to full motion video teleconferences and can reach its fullest potential in courses where many still visuals are required (e.g., math or engineering).

The Supreme Court of Virginia is developing a pilot which will allow the magistrates to take testimony via slow scan technology. They hope that it will allow their magistrates at over two hundred locations, to be more efficient. If the pilot is successful, they hope to use this, or a similar capacity statewide.

Potential Uses of Slow Scan

This technology could be used to deliver other courses, especially in a closed network configuration, such as the one serving the NVCC campuses. It could also be expanded as an add-on to traditional audio teleconferences.

Public Television Stations

There are nine public television (PTV) stations in Virginia owned and operated by four private, non-profit corporations. The stations are located in Norfolk (WHRO), Richmond (two stations: WCVE and WCVW), Fairfax County (two stations: WNVT and WNVC), Harrisonburg (WVPT), Roanoke (WBRA), Marion (WMSY), and Norton (WSBN). (See map, Appendix F.)

The television stations' combined signals reach approximately 95% of the Commonwealth's population. The stations' signals include subcarrier channels similar to those of the FM radio stations.

Broadcast Television Applications

During the past two decades, the state has contracted with the public television stations for delivery of educational materials, primarily to serve the local needs of the public schools.

For example, in Fiscal Year 1987-88, the state purchased more than 6,500 hours of broadcast and cable transmission time for elementary and secondary level instructional television programs (ITV). The total contract for ITV and related services was more than 3.7 million dollars.

Varina High School in Henrico County is currently using public television to distribute courses to other schools. Calculus, advanced placement English, and Latin courses are taught live from an electronic origination classroom at the school and sent via microwave to WCVW in Richmond for broadcast. Students at dozens of other high schools in Central Virginia watch the televised classes and telephone their questions to the teacher at Varina. These classes are also distributed in the Northern Virginia area over WNVC.

After the success of the Varina Program, a second electronic origination classroom was installed in Wise County. Using the broadcast signal of WBRA, WMSY and WSBN (the public television stations serving the Southwestern part of Virginia), classes are distributed to numerous school divisions in that area. These electronic classrooms allow students at schools that have insufficient enrollment at each location to justify hiring instructors in calculus, advanced placement English, and Latin, to have the opportunity to participate in necessary educational opportunities. These classes are also distributed to the Shenandoah Valley by WVPT in Harrisonburg. Projects such this are rapidly enabling all students in the state to have equal access to educational programs.

In addition to elementary and secondary ITV programs, the PTV stations also can broadcast college and university telecourses and feed local cable systems with both public and instructional programming.

When appropriate, the public television stations also produce and broadcast regional or statewide teleconferences. For example, Governor Gerald Baliles held a teleconference meeting with the Southwest Virginia Economic Development Commission and regional leaders which was broadcast throughout the Southwest portion of the state. Participants at four different sites were able to interact with the Governor via audio teleconference while the public at large could watch and listen.

Potential Uses of Television

The capacity of the public broadcasting stations could be expanded by "downloading" ITV programs between midnight and 6:00 a.m., i.e., broadcast of ITV programs during late night or early morning hours for recording by local schools and playback at convenient times throughout the day. The increasing number of VCRs in the schools makes this a more viable option than it was a few years ago. Downloading not only enables teachers to use programs at their convenience, it also opens up daytime broadcast hours for live, interactive programming.

The Governor's Commission on Excellence in Education has recommended that the electronic origination classroom concept be expanded to include classroom studios in other areas of the state for origination of programs to be broadcast within the region or statewide by the public television stations. Until that time, the public television stations are taking the programming from existing electronic origination classrooms (Varina and Wise County) and distributing them to other areas (Northern Virginia and the Shenandoah Valley).

Microwave and ITFS

Over the years, the public television stations have developed a two-way full duplex microwave network (see map, Appendix G) to provide common statewide cultural and educational programming.

Programs may be sent to and from the stations in Norfolk, Richmond, Falls Church, Harrisonburg, and Roanoke. There are a number of ancillary links into this network: Virginia Tech in Blacksburg (transmit/receive), the University of Virginia in Charlottesville (transmit only and receive via cable television), Old Dominion University in Norfolk (transmit and receive via fiber optic cable), Varina High School in Henrico County (transmit only), Wise County (transmit only), and the DIT Executive Teleconferencing Center in downtown Richmond (transmit by microwave and receive via ITFS). There is also a temporary microwave connection between the General Assembly Building in Richmond and WCVE to provide special programming from the State Capitol.

Using the network, all of the interconnected PTV stations, ODU, VPI, UVA, Varina High School, Wise County, and DIT have access to state-owned satellite uplinks in Richmond, Blacksburg, Norfolk and to privately owned uplinks in Northern Virginia. These locations may originate programming to be sent to the satellite for distribution across the state or around the world.

Four of the public television stations have local area transmitters called Instructional Television Fixed Service or ITFS. ITFS reception requires a special receiver and the signal is generally limited to a 15 to 20 mile radius of the sending station. PTV station-owned ITFS channels are located in: Norfolk (4); Hampton (4); Williamsburg (1); Eastville (Eastern Shore) (1); Richmond (4); Falls Church (2); and Roanoke (2). (See ITFS map, Appendix H.)

The PTV stations have applied for additional channels, including: Northern Virginia (2); Virginia Beach (4); Newport News (2); Williamsburg (3); Mathews (2); West Point (2); Central Garage (2); Richmond (2); Suffolk (2); Franklin (4); Eastern Shore (Eastville) (3); Accomack (4); Tangier Island (1). All are awaiting Federal Communications Commission consideration.

In addition, Richmond City Schools operate three channels of ITFS and George Mason University Foundation operates four channels. In cooperation with the Department of Information Technology, Northern Virginia Community College has applied for four ITFS channels in the Northern Virginia area for use by the five campuses of the College and for other Commonwealth purposes determined by DIT. [See Appendix I.]

Microwave/ITFS Network Applications

In September 1983, the Cooperative Graduate Engineering Program was delivered via the microwave network. In fall 1984 an expanded schedule of courses was sent to the Richmond area, Hampton Roads and Northern Virginia for distribution via ITFS. Until the installation of the satellite system, this microwave network was the key system for delivery of this important educational program.

Starting in fall 1988, the microwave network will be used for secondary education programming with the classes from the electronic origination classrooms at Varina and Wise which will be shared with other regions of the state (the signal is sent via microwave and then broadcast to four regions of the state).

Potential Uses of the Microwave/ITFS Network

The network serves as a key electronic highway for delivery of teleconferences and for sharing programs and other information among the public television stations and serves as a backup system in case of satellite uplink failure.

The ITFS system could be more fully utilized by state government and business and industry for limited audience teleconferences and training programs. For example, WHRO in Norfolk is already using ITFS for multiple purposes, including delivery of PBS Narrowcast Service programs to area businesses.

The Department of Education will continue to originate statewide in-service training teleconferences for microwave and broadcast distribution to local schools.

Cable

Cable television companies now serve approximately 90 per cent of Virginia's population. Since each locality has its own cable franchise, there is no easy way to arrange access to all the services simultaneously.

Cable Applications

The public television stations deliver telecourses and instructional television programs for Grades K-12 via direct feeds to cable companies in their areas.

Many colleges and universities have access to cable companies, either directly through head-ends, or indirectly through public television stations.

Potential Uses of Cable

The government and educational access channels of most cable companies in Virginia are not being used to capacity. This represents a prime opportunity for the Department of Education and higher education institutions to serve their regional client populations directly or via the public television stations.

The "must carry rules" of the FCC affect carriage of public television signals in Virginia and elsewhere and impact on what programming is available in any given service area.

Satellites

WCVE in Richmond operates a single channel (fully redundant) C-band uplink at its studios. Through the microwave network, each of the PTV stations in Norfolk, Harrisonburg, Falls Church and Roanoke, and DIT through its teleconferencing center, are able to originate programmming for uplinking to the satellite. [See map, Appendix G.]

Virginia Tech in Blacksburg operates a single channel (fully redundant) C-band satellite uplink. The uplink is accessible to the public television (PTV) network so any potential user who has access to the PTV network, could potentially have access to this uplink.

The University of Virginia operates a dual channel (with redundancy) C-band uplink. Currently the uplink is not accessible from the PTV network, but access is being planned for the future.

Old Dominion University in Norfolk is in the process of installing a Ku-band uplink which should be operational by November 1988. The uplink is a single channel with no redundancy, and is accessible via optic fiber to the PTV network.

The Richmond uplink serves as a backup for the universities' facilities and is the main satellite distribution center for the Commonwealth.

Each of the public television stations has satellite downlinks to receive signals from any domestic satellite. State agencies, colleges and universities have downlinks which can be used to receive satellite-delivered programs. (See map, Appendix J.) The Virginia Cooperative Extension Service (through Virginia Tech) has a growing network of C-band downlinks. Currently there are fifty-five (55) in place throughout the state. (See map, Appendix K.) These downlinks may be scheduled on a limited basis for teleconferences. Several of the locations also have Ku-band capacity.

DIT contracts for satellite transponder (channel) time for use by all state agencies and institutions. This bulk purchase allows the Commonwealth to realize substantial cost savings.

Satellite Applications

Currently the most extensive use of the satellite network to date is by the Cooperative Graduate Engineering Program. Beginning in September 1986, students statewide and outside Virginia have been able to attend graduate engineering classes taught live from the campuses of Virginia Tech and the University of Virginia (UVA). The students view the classes sent to a satellite and received via downlink and then talk with professors and other students by using the teleconferencing bridge. Starting in September 1988, two additional universities, Virginia Commonwealth University in Richmond and Old Dominion University in Norfolk, will be originating classes. Graduate students in Virginia have access to a dozen degree programs from three universities and several thousand hours of instruction via satellite.

Other baccalaureate and graduate courses and programs are also being distributed via satellite. UVA sends undergraduate commerce courses to Clinch Valley College. Tech will be sending MBA classes to Mary Washington College and other locations. UVA has sent graduate courses in physics and remedial reading to secondary teachers.

Satellite is also being used for secondary education. One of the recommendations of the Governor's Commission on Excellence in Education was to install satellite downlinks at public schools. Starting in September 1988, six high schools are participating in a pilot program. Six sites (which currently do not have access to the electronic classroom, or even traditional broadcast instructional television (ITV) programming) are installing satellite C/Ku-band downlinks. These six schools will now be able to receive classes from the Varina electronic classroom and other national programs such as TI-IN. Two courses from Varina will be distributed both over broadcast and via satellite simultaneously. During the 1988-89 school year, hundreds of other schools are planning to install downlinks to take advantage of the many hours of live educational offerings.

State agencies and institutions use the capability of the public television stations and DIT to link up with any domestic satellite to both originate and receive video teleconferences. Besides DIT, participants in national teleconferences include the Department of Social Services, Virginia Commonwealth University, the Department of Rehabilitative Services, the State Police, the Department of Education, and the State Council for Higher Education in Virginia. In addition, state agencies make extensive use of the capacity to reach state audiences. The use ranges from "Treatment of the AIDS Patient," to "Live Cattle Auctions."

Potential Uses of Satellites

The Virginia Community College System could use the system to deliver foreign language and other courses to provide access to students at all institutions. This would be especially helpful for multiple campus colleges and for those without the funds or sufficient numbers of students to hire individual teachers.

The Department of Health could use video teleconferencing on a daily basis to reach local offices with the latest in public health information and training.

The Department of Correctional Education could install downlinks and use this technology to reach the inmate population and the staff at the state's correctional institutions. This would provide both training and instructional opportunities at a reasonable cost.

Fiber Optics

This is a broadband technology which transmits high speed data, audio, and video signals through a light beam over a network of glass fibers. The state has recently signed contracts with vendors who will provide a backbone network to be used by the state. Within only a few years, it is expected that all the major cities in the state will be tied together.

Fiber Applications

Currently, WHRO in Norfolk has a fiber optic cable link installed across the street to Old Dominion University to handle reception and delivery of video programming.

Potential Uses of Fiber Optics

The Commonwealth is studying the feasibility of establishing a comprehensive statewide communications network to carry all message forms and fiber optic cable is one of the main technologies under review. Fiber could be used to connect institutions and agencies with the microwave network/satellite uplinks.

Other Technologies

Other technologies allow the use of FM radio and television subcarrier channels to distribute digital information (Subsidiary Communications Authorization or SCA). The delivery of computer data by FM subcarrier channels could allow distribution of computer-assisted instruction to many sites simultaneously and provide electronic mail for state agencies and institutions.

The FCC has granted television stations the right to use the "vertical blanking interval" (VBI) for teletext, paging services and data transmission. This signal "piggybacks" on the traditional broadcast television signal without any visible change in the conventional image.

Multiplexing is a technique which essentially "squeezes" two or three broadband video signals onto one channel. Compressed video systems reduce the amount of information in a full-motion, color picture so it can be sent over a narrower transmission channel at much less cost. Both technologies are still in transition.

Newer satellite technologies such as the higher frequency Ka-band may also help ensure that the Commonwealth will have ample video capacity in the future.

Optical disc technology provides thousands of stored images which can be accessed by microcomputer within a matter of seconds. This learning tool is being used extensively by the armed forces, and is beginning to become more widespread in the public schools as the cost of the videodisc equipment continues to drop. There is a great revolution going on in the optical disc market, with compact discs available for audio and video, optical discs which are used primarily for data storage, and CD-ROM, or compact disc-read only memory. Discs are becoming smaller and capable of holding increasing amounts of information and sophisticated visual material.

Applications Planning

There are several "rules of thumb" which should be used when determining which distribution technology to use to achieve your purposes. The following are some general guidelines on when to use the major transmission capacities available in Virginia.

Broadcast television or radio: This technology is generally used to reach a mass audience, either regionally or statewide, using the public television and radio stations. Programs should be delivered in this manner if they must reach a large number of people in many different locations. Consideration must be given to the existing program schedules well in advance of the planned event.

Cable television: Cable is generally good to reach an audience in a particular locality. Since cable penetration is not 100% in any given area and is nonexistent in some areas, it cannot be seen as a method of reaching the maximum number of people in a region.

Satellite: Satellite technology is most cost effective when used to reach a large number of widely separated sites equipped with downlinks. Satellite transmissions are relatively inexpensive if there are sufficient numbers of receive sites to warrant the cost of uplinking, transponder time, and downlink site costs.

Instructional Television Fixed Service: ITFS is a "last mile" technology for delivery of a signal to the receive location. ITFS transmitters distribute the signal in a 15 to 20 mile radius to special downconverters or receivers. The signal is basically line of sight from the transmitter, so it may not be appropriate for areas with many tall buildings or geographical considerations which would limit the signal distribution further. However, it can be a cost effective way to reach limited audiences in specific regions (see Appendices H and I).

Microwave: The PTV stations' microwave network can be used to send one-way or two-way video signals among the stations for distribution to a meeting room at the station or via broadcast, cable, or ITFS. Programming usually originates at:

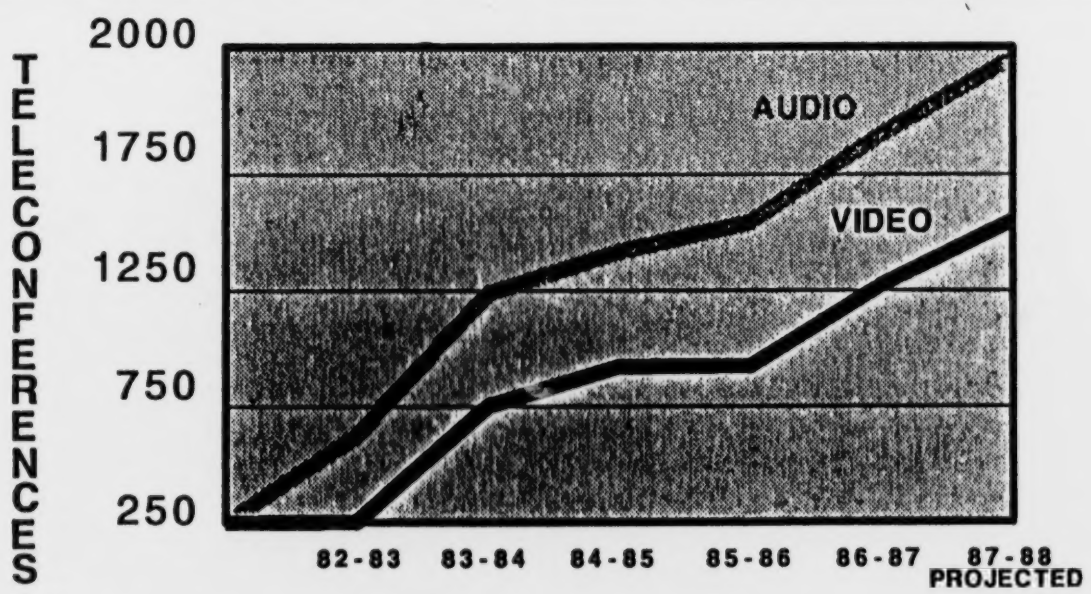
- one of the PTV stations,

- a remote site with microwave hop to the nearest PTV station,

- one of the ancillary links of the network (e.g., DIT, Tech, Varina, Wise County, or ODU),

- or via satellite (downlinked at one station and sent to one or more of the other stations via microwave).

ADMINISTRATIVE & EDUCATIONAL AUDIO & VIDEO TELECONFERENCING USAGE



CHAPTER 35.2.

INFORMATION TECHNOLOGY.

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ARTICLE 1.

Definitions.

§ 2.1-563.13. Definitions. — As used in this chapter:

"Board" means the Virginia Public Telecommunications Board.

"Communications Services" includes telecommunications services, automated data processing and word processing services, and management information systems that serve the needs of state agencies and institutions, but does not include telecommunications services and facilities under the direct control of the Department of State Police.

"Department" means the Department of Information Technology.

"Director" means the Director of the Department of Information Technology.

"Noncommercial telecommunications entity" means any enterprise which:

1. Is owned and operated by the Commonwealth, a political or special purpose subdivision of the Commonwealth, a public agency, or a nonprofit private foundation, corporation or association; and

2. Has been organized primarily for the purpose of disseminating audio or video noncommercial educational and cultural programs to the public by means other than a primary television or radio broadcast station, including but not limited to, coaxial cable, optical fiber, broadcast translators, cassettes, discs, microwave or laser transmission through the atmosphere.

"Nonprofit" means that no part of the net earnings inures, or may lawfully inure, to the benefit of any private shareholder or individual.

"Public broadcast station" means a television or radio broadcast station which:

1. Is eligible to be licensed by the Federal Communications Commission as a noncommercial educational radio or television broadcast station and which is owned and operated by a public agency or nonprofit private foundation, corporation, or association; or

2. Is owned and operated by a municipality and which transmits only noncommercial programs for educational purposes.

"Public telecommunications entity" means any enterprise which:

1. Is a public broadcast station or a noncommercial telecommunications entity; and

2. Disseminates public telecommunications services to the public.

"Public telecommunications facilities" means all apparatus, equipment and material necessary for or associated in any way with the production, distribution, interconnection captioning or broadcasting or interconnection or other distribution of programming including the buildings and structures necessary to house such apparatus, equipment and material and the land necessary therefor for the purpose of providing public telecommunications services, but not telecommunications services.

"Public telecommunications services" means noncommercial educational and cultural radio and television programs, and related noncommercial instructional or informational material that may be transmitted by means of electronic communications.

"Telecommunications" means any origination, transmission, emission, or reception of signs, signals, writings, images, and sounds or intelligence of any nature, by wire, radio, television, optical, or other electromagnetic systems.

"Telecommunications facilities" means apparatus necessary or useful in the production, distribution, or interconnection of electronic communications for state agencies or institutions including the buildings and structures necessary to house such apparatus and the land necessary therefor; provided, however, computer and computer terminal facilities and wireless communications facilities under the direct control of the Department of State Police shall not be included in this definition.

"Telecommunications services" means telecommunications to serve the needs of state agencies and institutions but shall not include public telecommunications services nor wireless communications services and systems under the direct control of the Department of State Police. (1984, c. 746.)

ARTICLE 2.

General Provisions; Department of Information Technology.

§ 2.1-563.14. Creation of Department; appointment of Director. — There is hereby created a Department of Information Technology. The Department shall be headed by a Director who shall be appointed by the Governor to serve at his pleasure for a term coincident with his own.

Whenever in this title and in the Code of Virginia reference is made to a division, department or agency hereinafter transferred to this Department, it shall mean the Department of Information Technology. (1984, c. 746.)

§ 2.1-563.15. Powers and duties of Director. — The Director of the Department of Information Technology shall, under the direction and control of the Governor, exercise such powers and perform such duties as are conferred or imposed upon him by law and he shall perform such other duties as may be required of him by the Governor or the Board. (1984, c. 746.)

§ 2.1-563.16. General powers of Department. — The Department shall have the following general powers, all of which, with the approval of the Director of the Department, may be exercised by a division of the Department with respect to matters assigned to that division:

1. Employ such personnel as may be required to carry out the purposes of this chapter;

2. Make and enter into all contracts and agreements necessary or incidental to the performance of its duties and the execution of its powers under this chapter, including, but not limited to, contracts with the United States, other state agencies and governmental subdivisions of the Commonwealth;

3. Accept grants from the United States government and agencies and instrumentalities thereof and any other source. To these ends, the Department shall have the power to comply with such conditions and execute such agreements as may be necessary, convenient or desirable;

4. Prescribe rules and regulations necessary or incidental to the performance of duties or execution of powers conferred under this chapter;

5. Establish fee schedules which may be collectible from users when general fund appropriations are not applicable to the services rendered;

6. Administer, under the direction of the Board, funds appropriated to it for public telecommunications and make contracts related thereto; and

7. Do all acts necessary or convenient to carry out the purposes of this chapter. (1984, c. 746; 1985, c. 265.)

ARTICLE 3.

Information Control and Program Oversight.

§ 2.1-563.17. Powers and duties. — The Department shall have the following powers and duties concerning the planning, budgeting, acquiring, using and disposing of communications equipment and services:

1. To formulate policies, standards, and specifications for telecommunications, automated data and word processing, and management information systems.

2. To analyze and approve all procurements of interconnective telecommunications facilities, telephones, automated data and word processing, and other communications equipment and goods.

3. To review and approve all agreements and contracts for communications services prior to execution between a state agency and another public or private agency.

4. To develop and administer a system to monitor and evaluate executed contracts and billing and collection systems.

5. To exempt from review requirements, but not from the state's competitive procurement process, any state agency which establishes, to the satisfaction of the Department, its ability and willingness to administer efficiently and effectively the procurement of communications services. Laboratory equipment containing microprocessors which will be employed solely for "realtime" research purposes are exempt, but all exemptions are subject to post-audit by the Department.

This section shall not be construed or applied so as to infringe upon, in any manner, the responsibilities for accounting systems assigned to the Comptroller under § 2.1-196.1. (1984, c. 746.)

ARTICLE 4.

Information Services.

§ 2.1-563.18. Powers and duties. — The Department shall have the following powers and duties concerning the development, operation and management of communications services:

1. To manage and coordinate the various communications facilities, centers, and operations used by the Commonwealth.

2. To acquire, lease, or construct such facilities and equipment as necessary to deliver comprehensive communications services; and to maintain such facilities and equipment owned or leased.

3. To provide technical assistance to state agencies in such areas as: (i) designing management information systems; (ii) performing systems development services, including design, application programming, and maintenance; (iii) conducting research and sponsoring demonstration projects pertaining to all facets of telecommunications; (iv) effecting economies in telephone systems and equipment; (v) planning and forecasting for future needs in communications services; and (vi) management studies and surveys of organizational structure, management practices and systems and procedures.

4. To develop and implement information, billing and collections systems which will aid state agencies in forecasting their needs and managing their operations.

This section shall not be construed or applied so as to infringe upon, in any manner, the responsibility for accounting systems assigned to the Comptroller under § 2.1-196.1. (1984, c. 746.)

ARTICLE 5.

Working Capital Funds.

§ 2.1-563.19. Automated Services Working Capital Fund. — There is hereby established an Automated Services Working Capital Fund to be used exclusively to finance automated systems design, development and testing services and staff of the Department. (1984, c. 746.)

§ 2.1-563.20. Computer Services Working Capital Fund. — There is hereby established a Computer Services Working Capital Fund to be used exclusively to finance computer operations and staff of the Department. (1984, c. 746.)

§ 2.1-563.21. Telecommunication Services Working Capital Fund. — There is hereby established a Telecommunication Services Working Capital Fund to be used exclusively to finance telecommunications operations and staff of the Department. (1984, c. 746.)

§ 2.1-563.22. Working Capital Funds; continuation. — A. All users of services provided for in this article administered by the Department shall be assessed a surcharge which shall be deposited in the appropriate fund. This charge shall be an amount sufficient to allow the Department to finance the operations and staff of the service offered.

B. All moneys existing in Working Capital Funds of the Department of Computer Services, Department of Management Analysis and Systems Development, and Department of Telecommunications are hereby transferred to the appropriate service's Working Capital Fund.

C. Additional moneys necessary to establish these funds or provide for the administration of the activities of the Department may be advanced from the general fund of the state treasury of the Commonwealth of Virginia. (1984, c. 746.)

Article 6.

Virginia Public Telecommunications Board.

§ 2.1-563.23. Virginia Public Telecommunications Board established; functions; membership; terms; chairman; meetings; expenses. — There is hereby created the Virginia Public Telecommunications Board. The Board shall be charged with assisting the various public telecommunications entities of the Commonwealth in the construction, establishment, operation, and use of public telecommunications facilities and services.

Notwithstanding the provisions of § 2.1-42.1, the Board shall consist of fourteen members, including the President of the Board of Education, the Chairman of the State Council of Higher Education, the Chairman of the State Board of Community Colleges, and the Chairman of the Board of Trustees of the Virginia Museum of Fine Arts. The remaining members shall be appointed by the Governor, one from each congressional district of the Commonwealth, the appointments to be subject to confirmation by the General Assembly. Such members from congressional districts shall be appointed for the following initial terms: two shall be appointed for a term of one year each, two shall be appointed for a term of two years each, three shall be appointed for a term of three years each and three shall be appointed for a term of four years each. Thereafter, the successors of all appointed members shall be appointed for a term of four years each. Vacancies other than by expiration of the term shall be filled by the Governor for the unexpired term. No member shall serve more than two consecutive four-year terms. No member of the Board may be the chief executive officer of any state agency, a member of the General Assembly, nor an officer, director or employee of any public telecommunications entity of the Commonwealth.

The Governor shall designate a member to serve as Chairman and the members may elect from their number a Vice-Chairman.

The Board shall meet at least quarterly and at the call of its Chairman.

Board members shall be reimbursed for their actual and necessary expenses for travel and subsistence incurred in performance of their duties as Board members away from their places of residence. Such expenses shall be paid from such funds as may be appropriated for the purpose. (1984, c. 746.)

§ 2.1-563.24. General powers. — The general powers of the Board are:

1. To request the services, expertise, supplies and facilities of the Department from the Director on issues concerning telecommunications.

2. To make and enter into all contracts and agreements necessary or incidental to the performance of its duties and the execution of its powers under this chapter, including but not limited to, contracts with the private sector, the United States, other state agencies, and governmental subdivisions of the Commonwealth.

3. To accept grants from the United States government and agencies and instrumentalities thereof and any other source. To these ends, the Board shall have the power to comply with such conditions and execute such agreements as may be necessary, convenient or desirable.

4. To prescribe rules and regulations necessary or incidental to the performance of duties or executions of powers conferred under this chapter concerning telecommunications.

5. To do all acts necessary or convenient to carry out the purposes of this chapter. (1984, c. 746.)

§ 2.1-563.25. Duties of Board. — The Board shall have the following specific duties and responsibilities:

1. To allocate and oversee the administration of appropriations, grants, gifts, and contributions for educational instruction, public programming, or other purposes.

2. To be responsible for all contractual and other relationships between the Commonwealth and the various public telecommunications entities in the Commonwealth. Appropriate actions include, but are not limited to:

a. Requiring such reports and conducting such inspections and investigations as it deems necessary;

b. Ensuring that agreements for the utilization of public telecommunications facilities and services are entered into and to determine the conditions thereof; and

c. Ensuring the acquisition, production and distribution of programs for public telecommunications services to any area of the Commonwealth.

3. To oversee and approve all planning relating to, and to forecast the needs of and for, public telecommunications services, facilities, and entities, including those portions of the master plan for telecommunications which relate to public telecommunications facilities, services, or entities, within the Commonwealth. Appropriate actions include, but are not limited to:

a. Ensuring the maintenance for an inventory of existing public telecommunications facilities and entities and to survey periodically the need for additional such facilities or entities; and

b. Ensuring the provision of assistance to the political subdivisions of the Commonwealth in matters relating to cable television and other public telecommunications facilities, services and entities.

4. To ensure that the development and use of public telecommunications facilities and services are coordinated. Appropriate actions include, but are not limited to:

a. Overseeing any network established for the purpose of interconnecting the various public telecommunications entities and facilities within the Commonwealth; and

b. Working with all state and federal agencies in matters involving the licensing and other registration of public telecommunications entities within the Commonwealth.

5. To recommend to the Governor policies pertaining to public telecommunications. (1984, c. 746.)

§ 2.1-563.26. Public Telecommunications Fund; grants; applications for grants; transfer of funds from Telecommunications Services Working Capital Fund. — A Public Telecommunications Fund, separate and apart from all public moneys and funds of the Commonwealth, is established. All moneys received by the Board for carrying out the purposes of this chapter shall be deposited in the fund. The Board shall have sole authority for dispersing grants from this fund. Grants shall be made from the Public Telecommunications Fund for the following purposes:

1. To continue state support of the capital construction programs of public broadcasting entities within the Commonwealth;

2. To continue the State Community Service Grant Program for public television stations;

3. To conduct and sponsor research into methods for improving public broadcasting services and the uses which might result from these improvements;

4. To purchase instructional television and radio services for the state's public school systems on behalf of the Department of Education, and for the state's higher education institutions on behalf of such institutions; and

5. To generally aid the public telecommunications entities within the Commonwealth in their efforts to serve the communities to which they broadcast.

Applications for grants from the Public Telecommunications Fund shall be made in such form and manner as prescribed by the Board. (1984, c. 746.)

§ 2.1-563.27. Conflicts between the Board and Department. — In carrying out the purposes of this chapter, whenever a conflict of authority arises between the Board and the Department related to public telecommunications facilities, services, or entities, the authority of the Board shall supersede that of the Department. (1984, c. 746.)

CHAPTER 35.2.

INFORMATION TECHNOLOGY.

Article 6.

Virginia Public Telecommunications Board.

Sec.

2.1-563.23. Virginia Public Telecommunications Board; functions; membership; terms; chairman; meetings; expenses.

Article 7.

Council on Information Management.

2.1-563.28. Council on Information Management established; purpose.

Sec.

2.1-563.29. Membership of Council; terms and officers; meetings and expenses; bylaws.

2.1-563.30. Employment of Director and other personnel.

2.1-563.31. General powers of Council; powers and duties of Council.

2.1-563.32. Advisory Committees to the Council.

2.1-563.33. Submission of budget requests of the Council.

2.1-563.34. Department support to the Council.

2.1-563.35. Conflicts between the Council and the Department.

ARTICLE 6.

Virginia Public Telecommunications Board.

§ 2.1-563.23. Virginia Public Telecommunications Board; functions; membership; terms; chairman; meetings; expenses. — The Virginia Public Telecommunications Board within the Department of Information Technology is continued. The Board shall be charged with assisting the various public telecommunications entities of the Commonwealth in the construction, establishment, operation, and use of public telecommunications facilities and services.

Notwithstanding the provisions of § 2.1-42.1, the Board shall consist of fourteen members, including the President of the Board of Education, the Chairman of the State Council of Higher Education, the Chairman of the State Board of Community Colleges, and the Chairman of the Board of Trustees of the Virginia Museum of Fine Arts. Any of the foregoing designated members may, with prior notification to the Chairman of the Virginia Public Telecommunications Board, delegate another member of his respective board or council to serve in his stead. The remaining members shall be appointed by the Governor, one from each congressional district of the

Commonwealth, the appointments to be subject to confirmation by the General Assembly. The successors of all appointed members shall be appointed for a term of four years each. Vacancies other than by expiration of the term shall be filled by the Governor for the unexpired term. No member shall serve more than two consecutive four-year terms. No member of the Board may be the chief executive officer of any state agency, a member of the General Assembly, nor an officer, director or employee of any public telecommunications entity of the Commonwealth.

The Governor shall designate a member to serve as Chairman and the members may elect from their number a Vice-Chairman.

The Board shall meet at least quarterly and at the call of its Chairman.

Board members shall be reimbursed for their actual and necessary expenses for travel and subsistence incurred in performance of their duties as Board members away from their places of residence. Such expenses shall be paid from such funds as may be appropriated for the purpose. (1984, c. 746; 1988, c. 10.)

The 1988 amendment deleted "There is hereby created" at the beginning of the first sentence in the first paragraph, inserted "within the Department of Information Technology is continued" in the second sentence of the first paragraph, inserted the second sentence of the second paragraph, deleted the [illegible] paragraph which tricts shall be appointed for the following initial terms: two shall be appointed for a term of one year each, two shall be appointed for a term of two years each, three shall be appointed for a term of three years each and three shall be appointed for a term of four years each," and deleted "Thereafter" at the beginning of the present fourth sentence of the

ARTICLE 7.

Council on Information Management.

§ 2.1-563.28. Council on Information Management established; purpose. — There is hereby established the Council on Information Management, a policy council within the meaning of § 9-6.25, hereinafter referred to as the Council. The purpose of the Council shall be to promote the coordinated planning, practical acquisition, effective development, and efficient use of information technology resources serving the needs of agencies and institutions of higher education in the Commonwealth. As used in this chapter, "information technology resources" means telecommunications, automated data processing, word processing and management information systems, and related equipment, goods and services. (1988, c. 424.)

§ 2.1-563.29. Membership of Council; terms and officers; meetings and expenses; bylaws. — A. Persons appointed to the Council shall be selected for their knowledge of and experience with information technology resources. No person, or representative of any person, firm or corporation which manufactures or sells information technology equipment, goods or services shall be eligible for appointment to the Council. No employee of the Commonwealth shall be eligible for appointment to the Council except as hereinafter specified.

B. The Council shall consist of nine members, six of whom shall be appointed by and serve at the pleasure of the Governor, subject to confirmation by a majority of the members elected to each house of the General Assembly, if in session when the appointment is made, and if not in session, then at its next succeeding session. The Governor shall designate one such appointed member as the Chairman, who shall serve not more than one

consecutive term as Chairman. The Council shall also include, as ex officio voting members, the Secretary of Administration, the Secretary of Finance, and the Secretary of Education. Of the members first appointed by the Governor, two shall be appointed for terms of four years, two for terms of three years, and two for terms of two years. Thereafter, the successors to the persons so appointed shall be appointed for terms of four years. Any vacancy occurring other than by expiration of a term shall be filled by the Governor for the unexpired term.

The Council shall elect a vice-chairman from its membership and may appoint a secretary and such other officers as it deems necessary and shall prescribe their duties and terms of office.

C. The Council shall meet once every two months for the transaction of business and at such other times as may be called by the Chairman. A quorum of the Council shall consist of five members.

Council members shall be compensated for the performance of their duties subject to the provisions of § 2.1-20.3.

D. The Council may adopt bylaws and operating procedures as may be necessary or desirable for its efficient and effective operation. (1988, c. 424.)

§ 2.1-563.30. Employment of Director and other personnel. — Staff of the Council shall include a Director, who shall be appointed by and serve at the pleasure of the Governor, subject to confirmation by the General Assembly in the same manner as the Council members. The Director shall be the chief executive officer of the Council and may employ such personnel as may be required to carry out the powers and duties of the Council. (1988, c. 424.)

§ 2.1-563.31. General powers of Council; powers and duties of Council. — A. The Council shall have the following general powers:

1. To make and enter into all contracts and agreements necessary or incidental to the performance of duties and the execution of its powers, including but not limited to contracts with the United States, other state agencies and governmental subdivisions of the Commonwealth.

2. To accept grants from the United States government and agencies and instrumentalities thereof and any source, other than any person, firm, or corporation, or director, officer, or agent thereof which manufacturers or sells information technology equipment, goods or services. To these ends, the Council shall have the power to comply with such conditions and execute such agreements as may be necessary, convenient or desirable.

3. To prescribe regulations necessary or incidental to the performance of its duties or execution of its powers; however, the provisions of the Administrative Process Act (§ 9-6.14:1 et seq.) shall not apply to such regulations.

B. The Council shall have the following powers and duties concerning the planning, budgeting, management and use of information technology resources. All agencies and institutions of higher education shall cooperate with the Council in the performance of its powers and duties:

1. To monitor trends and advances in information technology, to develop a comprehensive, statewide, four-year planning process, and plan for the acquisition, management, and use of information technology resources. The statewide plan shall be updated annually and submitted to the Governor. In developing and updating such plans, the Council shall consider the advice of the Department, and of agencies and institutions of higher education through the Advisory Committees to the Council provided for herein.

2. To provide agencies and institutions of higher education with information and guidelines in the development of information management plans and the preparation of budget requests for information technology resources.

3. To require agencies and institutions of higher education to submit information management plans to the Council and a copy to the Department. The Council shall have the authority to approve such plans and amendments thereto, including the Department's. All agencies and institutions of higher education shall maintain current information management plans which have been approved by the Council.

4. To monitor implementation of information management plans.

5. To direct the development and promulgation of policies, standards, and guidelines for managing information technology resources in the Commonwealth.

6. To review agency and institution budget requests for information technology resources and to recommend budget request priorities to the Department of Planning and Budget.

7. To direct the compilation and maintenance of an inventory of all information technology resources, including but not limited to personnel, facilities, equipment, goods and contracts for services.

8. To develop an approval process to ensure that all information technology procurements conform to the statewide information management plan and the information management plans of agencies and institutions of higher education. The Council shall be authorized to disapprove the procurements that do not conform to the statewide information management plan and the agency plans. (1988, c. 424.)

§ 2.1-563.32. Advisory Committees to the Council. — A. There are hereby established two advisory committees to the Council. The Agency Advisory Committee shall consist of nine members: seven representatives of agencies who shall be designated by the Governor annually, one member of a judicial agency who shall be designated by the Chief Justice of the Supreme Court, and the Director of the Division of Legislative Automated Systems. The Education Advisory Committee shall consist of nine members who shall be designated by the Governor annually: six members representing institutions of higher education and three members representing elementary and/or secondary education.

B. The Advisory Committees shall, in accordance with procedures prescribed by the Council, meet with, confer and advise the Council in the development of the Commonwealth's policies, standards, and guidelines for managing information technology resources. (1988, c. 424.)

§ 2.1-563.33. Submission of budget requests of the Council. — The Council shall develop policies and procedures which agencies and institutions of higher education shall follow when making budget requests for information technology resources equipment, goods and services. Such policies and procedures shall require consideration of current and future operating expenses, and shall be utilized by all agencies and institutions of higher education in preparing budget requests. The Council shall consult with the Department and the Department of Planning and Budget in the development of such policies and procedures. (1988, c. 424.)

§ 2.1-563.34. Department support to the Council. — The Department shall, at the request of the Council, provide administrative support to the Council and perform such other services as the Council may direct in the performance of its powers and duties. Support provided by the Department may include, but shall not be limited to, performing the following duties:

1. To advise the Council on trends and advances in information technology and the status of information technology resource development in the Commonwealth as a whole.

2. To review information management plans submitted by agencies and institutions of higher education to the Council and to provide advice and recommendations to the Council.

3. To monitor the implementation of information management plans by agencies and institutions of higher education, and provide findings and recommendations to the Council.

4. To advise the Council in the development, interpretation, and dissemination of its policies, standards, and guidelines, and to maintain records thereon for the Council.

5. To develop and maintain an inventory of the Commonwealth's information technology resources, including personnel, facilities, equipment, goods, and contracts for services. (1988, c. 424.)

§ 2.1-563.35. Conflicts between the Council and the Department. — In the event of a conflict of authority between the Council and the Department relating to the Council's performance of its powers and duties under this chapter, the authority of the Council shall supersede that of the Department. (1988, c. 424.)

DEPT. OF ... 31 ... 34

COMMONWEALTH of VIRGINIA

J. WESTWOOD SMITHERS, JR.
Director

Department of Information Technology
110 SOUTH SEVENTH STREET
RICHMOND, VIRGINIA 23219
(804) 344-5000

June 1, 1988

MEMORANDUM

TO: Heads of all State Agencies and Institutions

FROM: J. Westwood Smithers, Jr.

RE: **Policy Governing the Acquisition of Public Telecommunications Services, Equipment and Facilities**

As you may be aware, the Department of Information Technology (DIT) and the Virginia Public Telecommunications Board have complementary jurisdiction to review, approve and coordinate the Commonwealth's acquisition and use of telecommunications services, equipment and facilities. As a general rule, all telecommunications acquisitions are subject to DIT's approval, whereas the Board (to which DIT is staff) reviews acquisitions which may support public telecommunications (television and radio broadcasting). The purpose of this memorandum is to explain and further define this policy so that future acquisitions of public communications resources will be more timely, efficient, and in compliance with the law.

Scope of Jurisdiction

The jurisdiction of the Board and DIT extends to all agencies and institutions, including institutions of higher education. Under State law, the approval of DIT is, in all cases, a condition precedent to any contract for telecommunications services, equipment and facilities. With respect to public telecommunications matters under the Board's jurisdiction, DIT grants its approval as the Board may direct.[1]

[1] Code of Virginia, Section 2.1-563.13 et seq.; Appropriations Act (1988-90), Section 4-5.06; Executive Order Number 30 (86); Department of General Services Agency Procurement and Surplus Property Manual (March, 1987), Sections 9.2c and 9.6a; Master State Plan for Public Telecommunications (1973 and 1974).

Reason for the Policy

The Commonwealth has a substantial and growing investment in telecommunications technology, which deserves the same prudent management as any other costly resource. The Board and DIT share the responsibility to support that objective by reviewing proposed acquisitions to ensure that new services and facilities will be efficient, cost-effective, and not duplicative of existing resources.

Pursuant to Section 2.1-563.17 of the Code, DIT formulates policies, standards and specifications for all telecommunications systems, and is required to approve the acquisition of (including contracts for) telecommunications services, equipment and facilities.[2] In the area of voice and data communications, agencies and institutions are aware of, and comply with, the procedures for approval by DIT's Telecommunications Division, as set forth in the Code of Virginia and the Agency Procurement and Surplus Property Manual. Also, DIT Directive 87-2 (November, 1987) prescribes approval of our Telemedia Division for the acquisition of media services (for audio visual productions), and agencies should be familiar with that requirement.

In the area of public telecommunications, however, there have been a few (although serious) misunderstandings of this agency's jurisdiction and that of the Public Telecommunications Board. In Virginia, public television and radio services are furnished primarily through Virginia's public, noncommercial broadcast stations. As you may know, the facilities operated by those stations are supported, in large measure, by general fund appropriations.

The Board is responsible for the oversight, planning, coordination and contractual relationships pertaining to all public telecommunications services and facilities.[3] Because the acquisition of new broadcasting resources for agencies and institutions is likely to affect the use of existing facilities already supported with general funds, DIT approves acquisitions which affect public telecommunications only after consultation with the Board.

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[2]The Code defines "telecommunications" in it broadest sense to include "any origination, transmission, emission, or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, television, optical, or other electromagnetic systems." (Section 2.1-563.14.)

[3]"Public telecommunications facilities" includes "all apparatus, equipment and material necessary for or associated in any way with the production, distribution, interconnection ... or other distribution of programming...." Section 2.1-563.13 of the Code.

In order to avoid any misunderstanding of how the Board and DIT exercise their oversight responsibilities, the following policy shall govern public telecommunications acquisitions by all State agencies and institutions:

STATEMENT OF POLICY

(1) As a condition precedent to the acquisition of any public telecommunications services, equipment or facilities, State agencies and institutions must obtain approval from the Department of Information Technology, which shall first obtain approval of the proposed acquisition from the Virginia Public Telecommunications Board.

(2) The services, equipment and facilities subject to this policy shall be as the Board and DIT may prescribe. They include, but are not limited to:

- Satellite uplinks and downlinks
- Satellite transponder services
- AM/FM/TV transmitters
- ITFS, microwave, light-link or fiber optic systems
- Cable television services
- Television and radio origination production facilities.

(3) Agencies and institutions wishing to acquire such services, equipment or facilities must request review and approval by DIT's Telemedia Division in advance of any procurement action. The procurement of goods and services will continue to be conducted as prescribed by the Department of General Services in the Agency Procurement and Surplus Property Manual.

Requests for approval should, therefore, be submitted when the agency or institution begins planning for the acquisition, which will enable DIT and the Board to expedite their approval. No acquisition will be approved for procurement until DIT and the Board have had an adequate opportunity to review the request on its merits.

(4) Requests for approval should be addressed to Dr. J. C. Phillips, Director, Telemedia Division, Department of Information Technology, 110 South Seventh Street, Richmond, Virginia, 23219. Each request must include the following:

1. A statement of the service, equipment or facility desired, and the specific services it is intended to provide, including utilization projections specifying the proposed hours of use for broadcasting, etc.

2. An analysis of alternative services, equipment or facilities available from other agencies, institutions or public broadcasting entities which may provide the same or equivalent service, and a cost-benefit analysis which considers the use of any existing services or facilities in lieu of the proposed acquisition. In this analysis, the agency or institution must confirm that it has consulted with the public broadcasting entities serving its location to determine the possibility of shared use of services and facilities.

3. An analysis of any federal, state or other governmental approvals which may be required, including but not limited to Federal Communications Commission licensing.

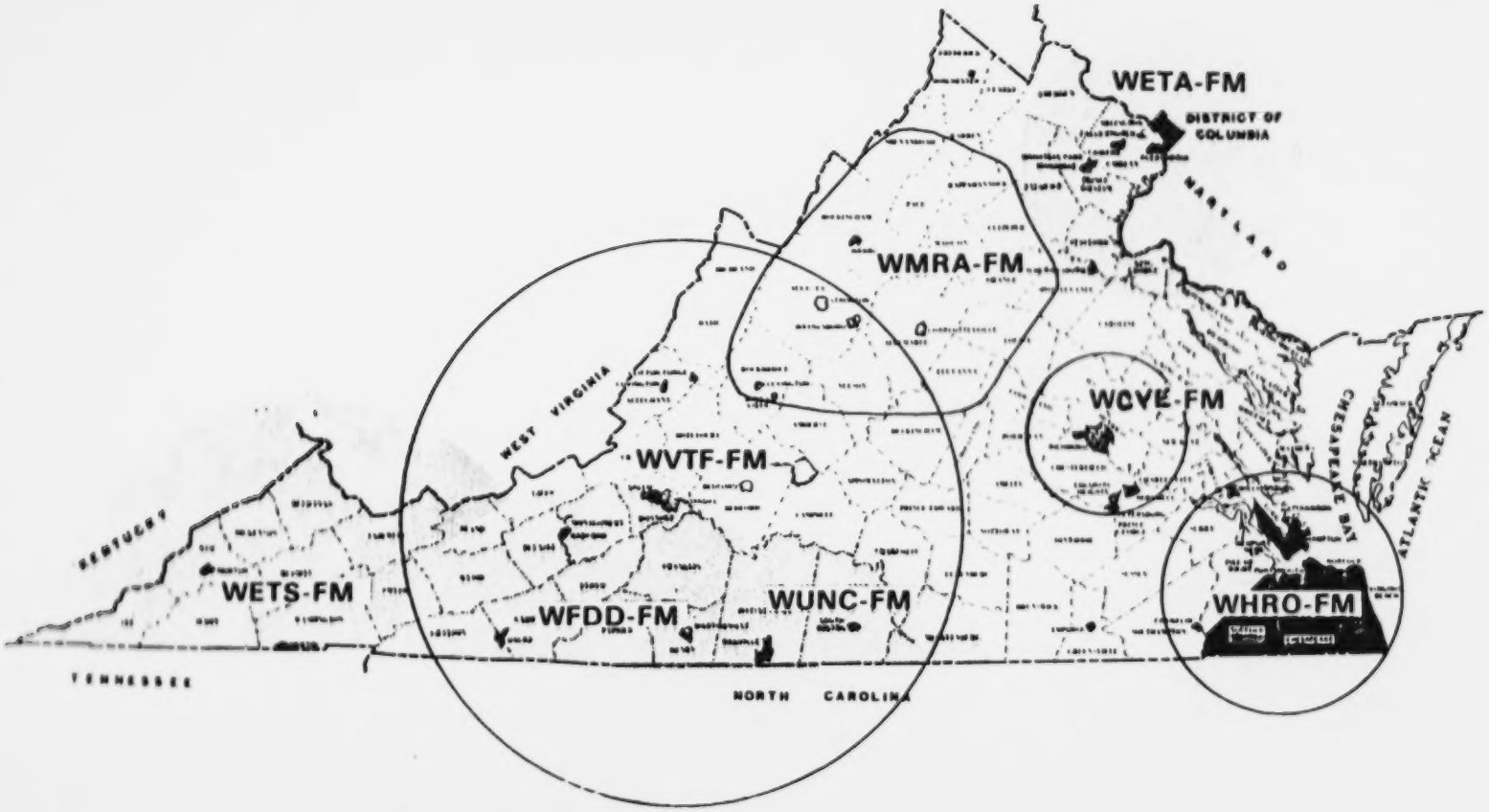
(5) Compliance with this policy is an essential prerequisite to a procurement action; any resulting contract between an agency or institution and a vendor executed without that approval would be ultra vires and, therefore, unlawful.

I trust that you appreciate the need for this policy, which is not a new regulation, but the restatement of existing statutory requirements, with more specific guidance than in the past which I think will be helpful. The essence of this policy, as the statutes which guide it, is to ensure that good business judgment is applied to our growing investment in telecommunications, and I know you share our desire to better manage that investment. Please ensure that the personnel responsible for telecommunications activities in your agency or institution are made aware of this policy.

/j

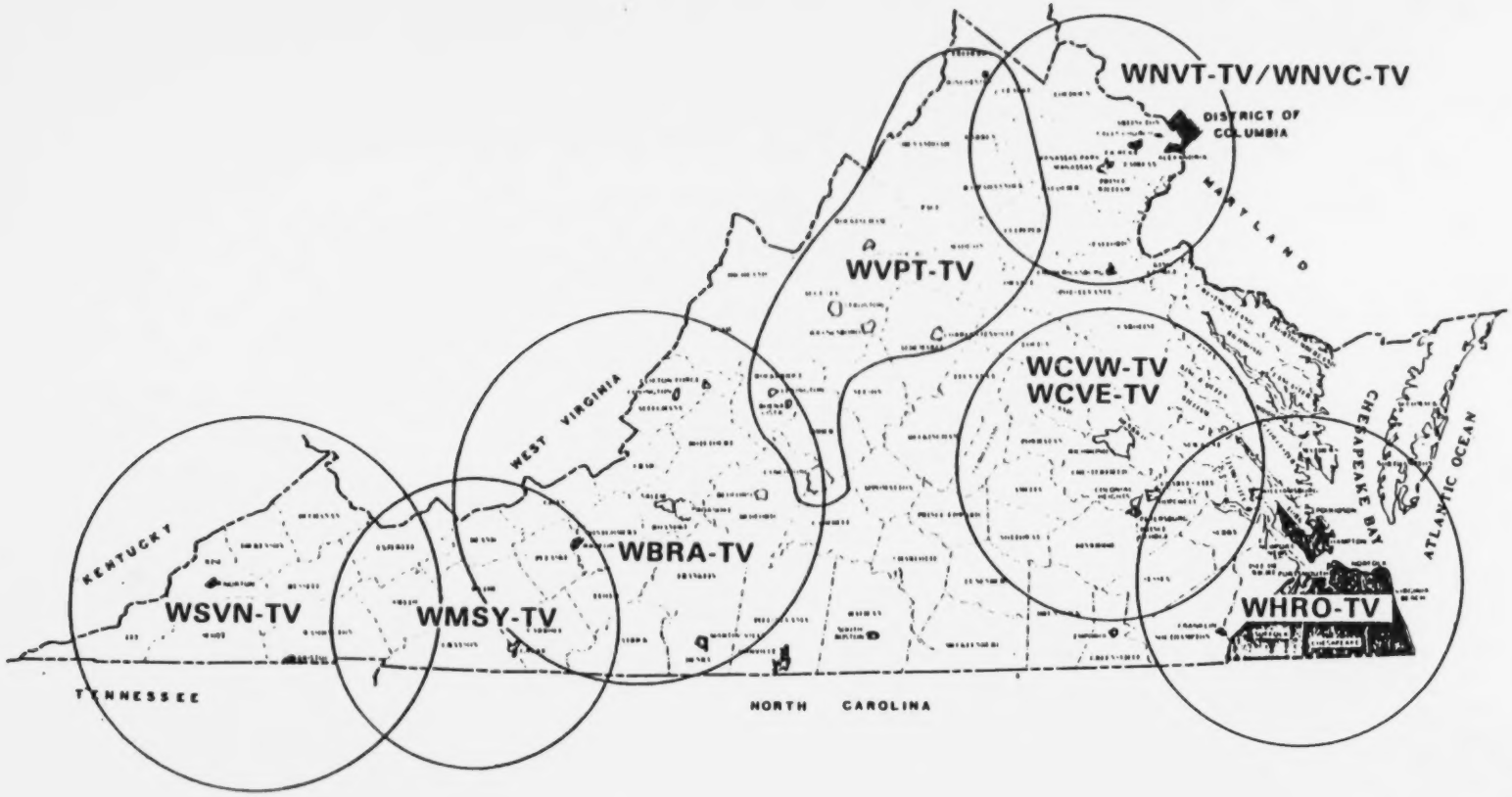
cc: Chief of Staff
Cabinet Secretaries
Chairman and Members,
Virginia Public Telecommunications Board

RADIO COVERAGE AREAS

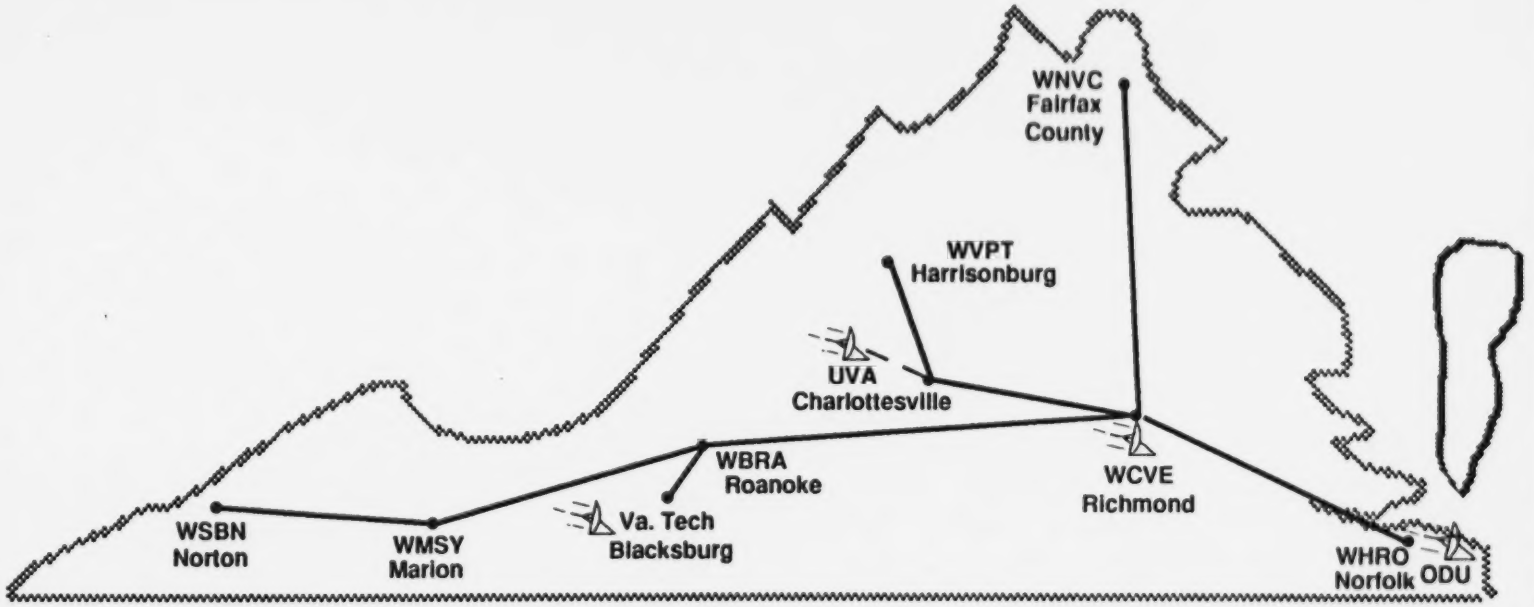


= Out of State Licensees With Virginia Coverage

TELEVISION COVERAGE AREAS



VIRGINIA PUBLIC TELEVISION MICROWAVE NETWORK AND VIRGINIA SATELLITE UPLINK FACILITIES



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UVA, WCVE

Ku band - ODU

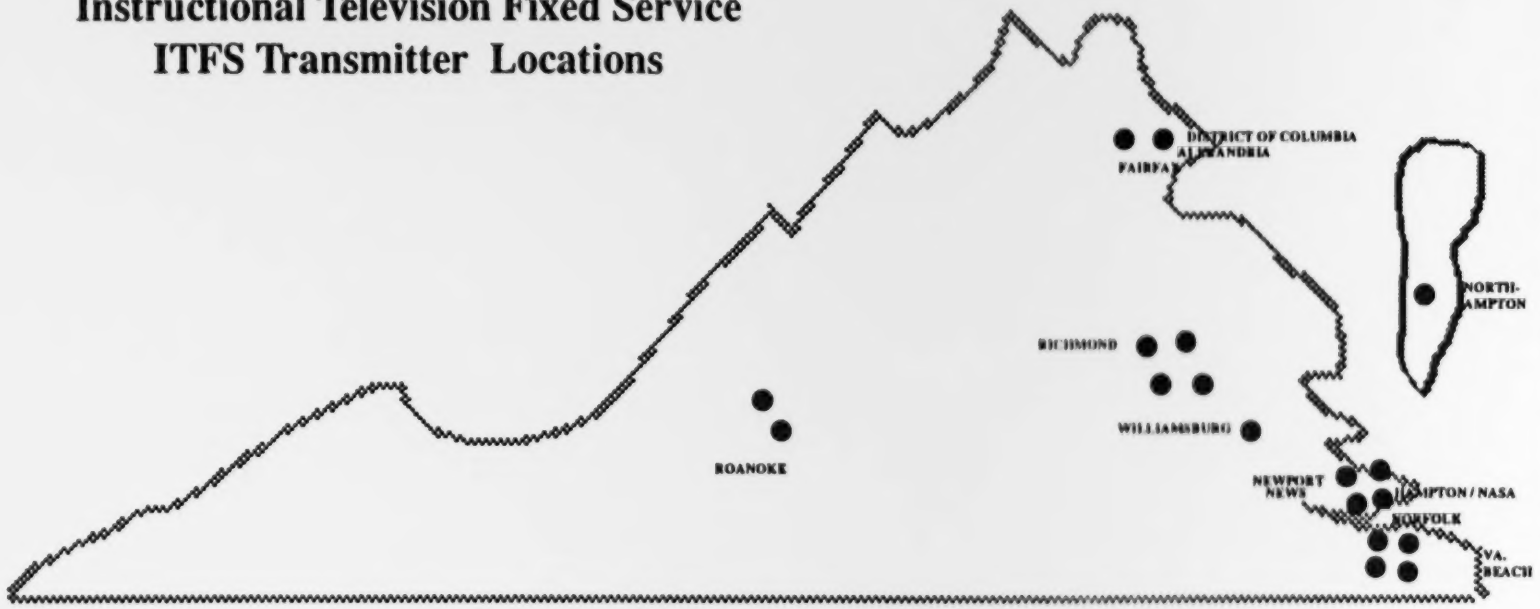
Revised 9/1/88

COMMONWEALTH OF VIRGINIA

Public Television

Instructional Television Fixed Service

ITFS Transmitter Locations



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WHRO, Norfolk--4
Peninsula--4
Northampton--1 Williamsburg--1

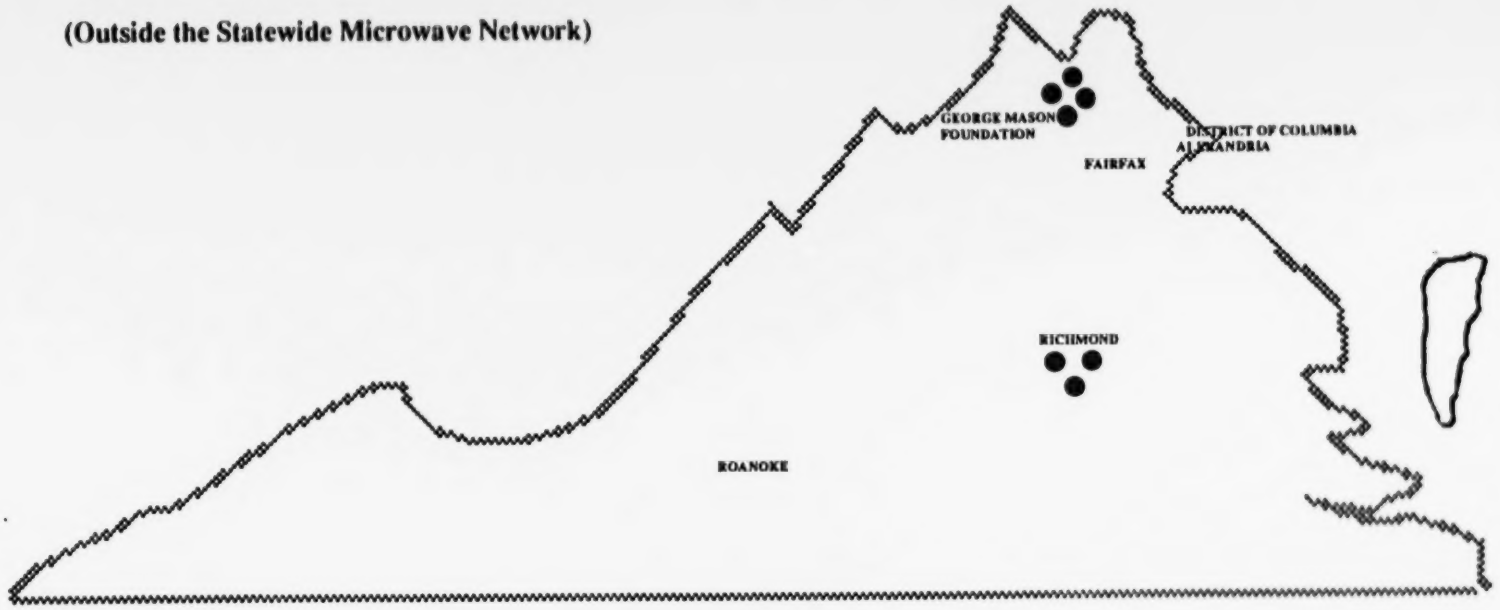
WCVE, Richmond--4

WBRA, Roanoke--2

Revised 9/1/88

COMMONWEALTH OF VIRGINIA
ITFS Transmitter Locations

(Outside the Statewide Microwave Network)



George Mason Foundation - 4
Richmond City Schools - 3

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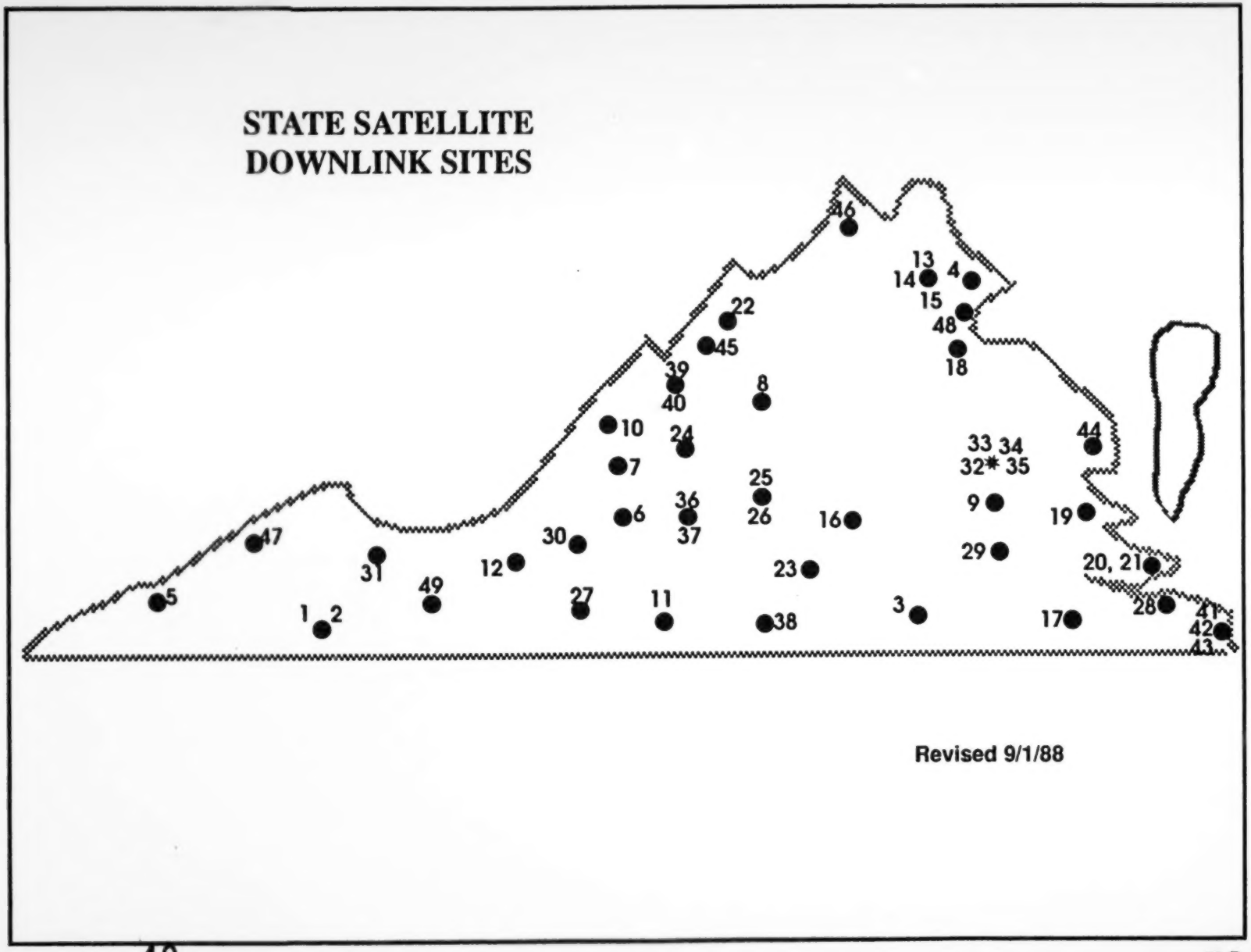
STATE SATELLITE
DOWNLINK SITES
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Revised 9/1/88

APPENDIX J

State Satellite Downlink Sites

* Denotes both C and Ku reception

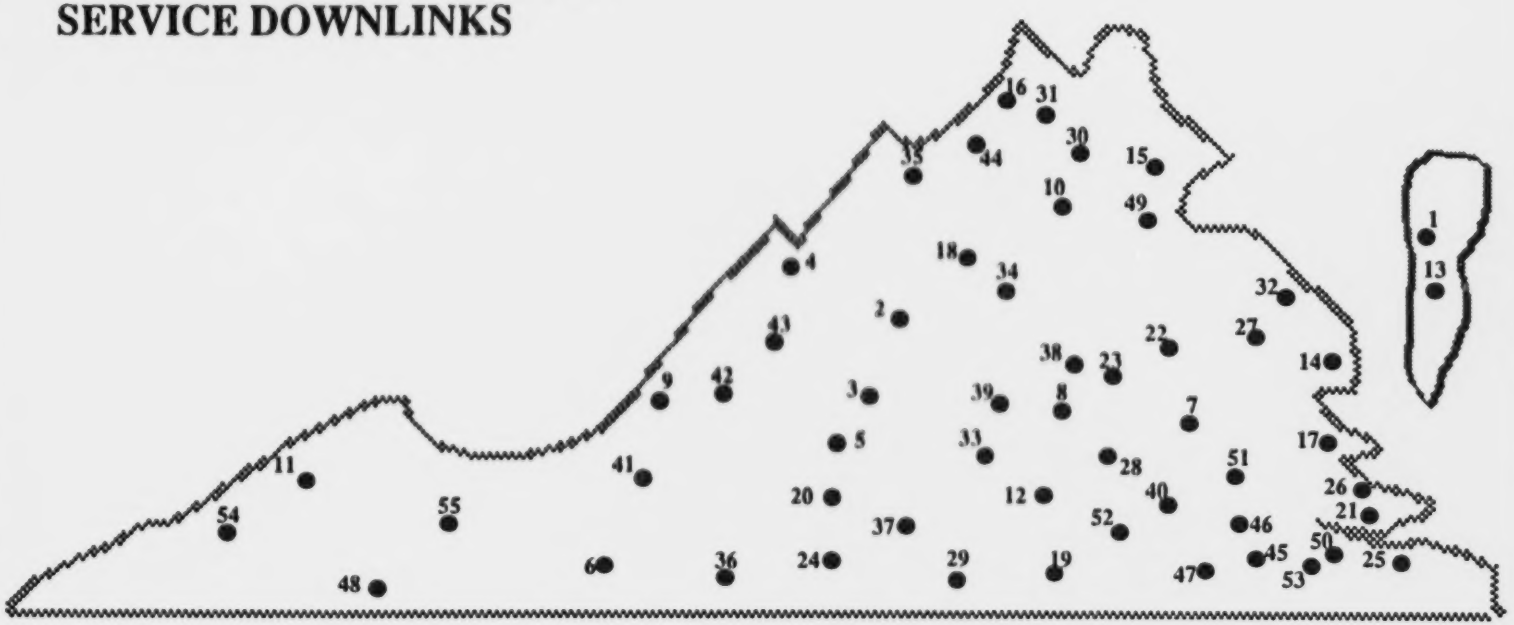
Abingdon:	UVA Continuing Education Center	1.
	Va. Highlands Community College*	2.
Alberta:	Southside Va. Community College	3.
Annandale:	Northern Va. Community College* (Extended Learning Institute)	4.
Big Stone Gap:	Mountain Empire Community College	5.
Blacksburg:	Virginia Tech*	6.
Catawba:	Catawba Hospital	7.
Charlottesville:	University of Virginia*	8.
Chester	John Tyler Community College	9.
Clifton Forge:	Dabney Lancaster Community College	10.
Danville:	Danville Community College	11.
Dublin:	New River Community College	12.
Fairfax County:	George Mason University (main campus)	13.
	Tech/UVA Continuing Education Center (Telestar)*	14.
	WNVC-TV	15.
Farmville:	Longwood College	16.
Franklin:	Paul D. Camp Community College	17.
Fredericksburg:	Mary Washington College*	18.
Glenns:	Rappahannock Community College	19.
Hampton:	Peninsula Graduate Center (ODU)*	20.
	Thomas Nelson Community College	21.
Harrisonburg:	WVPT-TV	22.
Keysville:	Southside Va. Community College	23.
Lexington:	Virginia Military Institute	24.

APPENDIX J

State Satellite Downlink Sites (Cont.)

Lynchburg:	Lynchburg College*	
	(Center for Advanced Engineering)	25.
	Central Virginia Community College*	26.
Martinsville:	Patrick Henry Community College	27.
Norfolk:	Old Dominion University (at WHRO)*	
	WHRO-TV*	28.
Petersburg:	Virginia State University	29.
Radford:	Radford University	30.
Richlands:	Southwest Va. Community College	31.
Richmond:	Department of Education (Monroe Building)*	32.
	Department of Information Technology*	33.
	Va. Commonwealth University* (East and West Campus)	34.
	WCVE-TV	35.
Roanoke:	Roanoke Graduate Center* (at Virginia Western Community College)	36.
	WBRA-TV	37.
South Boston:	S. Boston/Halifax Co. Cont. Educ. Ctr.*	38.
Staunton:	Staunton School for the Deaf and Blind	39.
	Western State Hospital	40.
Virginia Beach:	Old Dominion /Norfolk State University Graduate Center*	41.
	Tidewater Community College*	42.
	UVA/Tech Continuing Education Center*	43.
Warsaw:	Rappahannock Community College	44.
Weyers Cave:	Blue Ridge Community College	45.
Winchester:	Shenandoah College and Conservatory*	46.
Wise:	Clinch Valley College	47.
Woodbridge:	Northern Va. Community College	48.
Wytheville:	Wytheville Community College	49.

VIRGINIA TECH
COOPERATIVE EXTENSION
SERVICE DOWNLINKS



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APPENDIX K

Virginia Tech Cooperative Extension Service Downlinks

*Indicates C and Ku band capacities

1. Accomack County VCES
2. Albemarle County VCES (Charlottesville)
3. Appomattox County VCES
4. Augusta County VCES (Staunton)
5. Campbell County VCES (Rustburg)
6. Carroll County VCES (Hillsville)
7. Charles City VCES*
8. Chesterfield County VCES
9. Craig County VCES (New Castle)
10. Culpeper VCES
11. Dickenson County VCES (Clintwood)
12. Dinwiddie County VCES
13. Eastern Shore Agricultural Experimental Station (Painter)
14. Eastern Virginia Agricultural Research Station (Warsaw)
15. Fairfax County VCES
16. Frederick County/Winchester Research
17. Gloucester County VCES
18. Greene County VCES (Standardsville)
19. Greensville County VCES (Emporia)
20. Halifax VCES
21. Hampton City VCES
22. Hanover County VCES
23. Henrico County VCES (Richmond)
24. Henry County VCES (Collinsville)

Virginia Tech Cooperative Extension Service Downlinks (cont.)

25. Isle of Wight VCES
26. James City County VCES (Toano)*
27. King William County VCES*
28. Lee County VCES (Jonesville)
29. Mecklenberg County VCES (Boydton)
30. Northern District Office (Warrenton, Fauquier Co.)
31. Northern Virginia 4-H Educational Center (Front Royal)*
32. Northumberland County VCES (Heathsville)
33. Nottoway County VCES
34. Orange County VCES
35. Page County VCES (Luray)
36. Patrick County VCES (Stuart)
37. Pittsylvania County VCES (Chatham)
38. Powhatan County VCES
39. Prince Edward VCES (Farmville)
40. Prince George County VCES
41. Pulaski County VCES
42. Roanoke District Office
43. Rockbridge County VCES (Lexington)
44. Shenandoah County VCES (Woodstock)
45. Smith Mountain Lake 4-H Educational Center (Franklin)
46. Southeast 4-H Educational Center (Wakefield)
47. Southampton County VCES (Courtland)
48. Southwest 4-H Educational Center (Abingdon)
49. Stafford County VCES (Fredericksburg)
50. Suffolk County VCES

Virginia Tech Cooperative Extension Service Downlinks (cont.)

51. Surry County VCES
52. Sussex County VCES
53. Tidewater Agricultural Experiment Station (Suffolk)
54. Wise County VCES
55. Wythe County VCES (Wytheville)

GLOSSARY

AM: Amplitude Modulation.

Amplitude Modulation (AM): 535 - 1,605 kilohertz, AM radio channels 540-1,600.

Basic Cable: The primary cable television service that a subscriber may receive for a minimum monthly fee.

Beta: One of two half-inch sized videocassette recorder (VCR) formats. The other format is VHS.

Bridge: An electronic device designed to interconnect three or more communications channels such as telephone lines. Virginia's bridges can provide both operator-assisted conferences and meet-me (or dial-in) capabilities.

C-band: See Satellites.

Cable Television (CATV): A system in which video and audio signals are transmitted to television sets by coaxial cable instead of over the air broadcast. Also referred to as community antenna television. Some systems have capacities for two-way communication.

Cathode Ray Tube (CRT): Projects television pictures or computer information on a television screen or computer monitor.

CATV: See Cable Television.

CCTV: See Closed Circuit Television.

Closed Circuit Television (CCTV): A "private" system of transmitting television signals. Reception of the signals requires special receive equipment.

Compressed Video: Video images processed to remove redundant information, thereby reducing the amount of bandwidth required to send them over a telecommunications channel.

Corporation for Public Broadcasting: A private, non-profit organization established by the 1967 Public Broadcasting Act to facilitate the growth and the development of public telecommunications and to prevent external interference and control.

CPB: See Corporation for Public Broadcasting.

CRT: See Cathode Ray Tube.

Dish: Synonym for a satellite "earth station." An antenna that transmits or receives satellite transmissions.

Downlink: A satellite earth station for receiving (downlinking) satellite signals.

Downloading: The process of transmitting data, computer software, or video, from one point to another. For example, such materials may be downloaded over telephone lines or broadcast by radio or TV stations.

Educational Radio: Noncommercial radio operating to serve community needs. Many educational radio stations are operated by schools and universities. Educational radio stations qualified to receive federal funds administered by CPB are designated as public radio stations.

Educational Telecommunications: Information offered via satellite, ITFS, microwave, cable, radio, and open air broadcast to elementary/secondary, higher education, and continuing education students as part of a defined curriculum to meet specific educational objectives.

Educational Television (ETV): Noncommercial television operating to serve community needs. The term used more frequently is "public television."

Electronic Origination Classroom: Video production facility specifically designed for originating educational programming. Usually has limited production capability.

Electronic Receive Classroom: Standard classroom equipped to receive (only) electronic programming (audio or video).

ETV: See Educational Television.

FCC: See Federal Communications Commission.

Federal Communications Commission (FCC): A federal agency which regulates non-governmental interstate and foreign communications by telegraph, telephone, radio and TV broadcast, cable television, CB radio, satellite, and special safety services. Broadcast station, ITFS transmitter, and uplink licenses are granted and renewed by this agency.

Fiber Optics: Also called optical fibers or optical fiber bundles. An assemblage of transparent glass fibers bundled together parallel to one another. These fibers have the ability to transmit information, by a process of total reflection, around curves and into otherwise inaccessible places with an extremely low loss of definition.

FM: See Frequency Modulation.

Footprint: The geographic area covered by a satellite's signal. Satellites usually cover broad geographic regions.

Freeze Frame TV: A device that transmits and/or receives still video pictures over a narrow or medium-band channel, such as a telephone line. Also referred to as slow-scan TV.

Frequency Modulation (FM): 88 - 108 megahertz, FM radio channels 201-300.

Geo-synchronous: See Geostationary Orbit.

Geostationary Orbit: The path or orbit of a communications satellite 22,300 miles above the equator that makes it appear stationary from the earth.

GHz: See Hertz

Gigahertz (GHz): See Hertz.

Headend: Antennas and equipment located at the origination point for cable television transmissions.

Hertz (Hz): Cycles per second: a measure of electromagnetic frequency. Kilohertz (KHz) is 1,000 cycles per second; one megahertz (MHz) is one million; and one gigahertz (GHz) is one billion cycles per second.

Hz: see Hertz.

Instructional Television (ITV): Generally refers to elementary/secondary television programs broadcast over the public TV stations.

Instructional Television Fixed Service (ITFS): A low-powered TV service (reception within a 15 - 20 mile radius from the transmitter) that requires signal converters for viewing on ordinary TV sets.

Interactive: A technology that permits two-way communications or user participation. Computers and videodiscs are examples of communications technologies that may be interactive.

ITFS: See Instructional Television Fixed Service.

ITV: See Instructional Television.

Ka-band: See Satellites.

KHz: See Hertz.

Kilohertz (KHz): See Hertz.

Ku-band: See Satellites.

Laser: Light Amplification by Stimulated Emission of Radiation. A device that utilizes the natural oscillation of atoms or molecules to generate an extremely narrow beam of light. Utilized in fiber optics and optical videodiscs.

Leased Access: Arrangement under which a person or organization may contract for use of CATV channels set aside for such purposes by cable television operators.

Megahertz (MHz): See Hertz.

MHz: See Hertz.

Microwave: A line-of-sight, high-frequency radio wave (about 500 MHz) used for the transmission of broadcast signals.

MSO: See Multiple System Operator.

Multiple System Operator (MSO): A company that owns more than one cable television system.

Multiplexing: A technique used to transmit signals from different sources over a single channel at the same time.

Must-Carry Rule: A rule of the Federal Communications Commission that a cable system must transmit to subscribers all full-powered TV stations in its area. Not currently enforced by the FCC pending the outcome of a test case before the U.S. Supreme Court.

NAB: See National Association of Broadcasters.

NAPTS: See National Association of Public Television Stations.

Narrowcasting: Programs directed at a specific audience.

National Association of Broadcasters (NAB): The membership organization of commercial radio and television broadcasters.

National Association of Public Television Stations (NAPTS): A membership organization of public television stations which provides national representation, research, and planning services.

National Public Radio (NPR): A national membership organization of public radio stations which operates the public radio satellite interconnection system and produces and distributes national programming. The organization also provides promotion, development, research, and planning services.

National Telecommunications and Information Administration (NTIA): The division within the U.S. Department of Commerce responsible for administering federal public telecommunications facilities grant programs.

NPR: See National Public Radio.

NTIA: See National Telecommunications and Information Administration.

PBS: See Public Broadcasting Service.

PSSC: See Public Service Satellite Consortium.

PTFP: See Public Telecommunications Facilities Program.

PTV: See Public Television.

Public Access: The use of designated cable channels by members of the community at no charge by the CATV operator.

Public Broadcasting Service (PBS): A national membership organization of public television stations which operates the public television satellite interconnection, distributes national programming, and provides promotion, development, and a variety of other services.

Public Radio : Usually noncommercial FM radio stations operating to serve community needs in the areas of instruction, general education, the arts, news, and public affairs. These stations must satisfy certain requirements for programming, staffing, and funding to qualify for federal grants administered by the CPB. There are five public radio stations in Virginia. One is owned and operated by the Commonwealth.

Public Service Satellite Consortium (PSSC): An international nonprofit organization which serves as a broker of satellite services. The PSSC assists public service organizations in delivering their services more efficiently through the use of the new communications technologies, to have a voice at national and international forums, and to influence the future development of satellite technology.

Public Telecommunications Facilities Program (PTFP): A program of the National Telecommunications and Information Administration (NTIA) which provides matching grants for the planning and construction of public telecommunications facilities.

Public Television (PTV): Usually noncommercial UHF television stations operating to serve community needs in the areas of instruction, general education, the arts, news, and public affairs. The stations must satisfy minimum requirements for programming, staffing, and funding to qualify for federal grants administered by the CPB. There are nine public TV stations licensed to four private, nonprofit Virginia corporations.

SAP: See Second Audio Program.

Satellites: Communications devices in geo-synchronous orbit above the earth.

> C-band: 6 GHz uplink/4 GHz downlink. Mostly used for entertainment, teleconferencing, and educational purposes.
>
> Ku-band: 14 GHz uplink/12 GHz downlink. Mostly used for business data and voice purposes and some teleconferencing. Some entertainment networks are switching to these satellites.
>
> Ka-band: 30 GHz uplink/20 GHz downlink. Experimental frequency requiring very small receive dishes. First satellites to be launched in 1988.

SCA: See Subsidiary Communications Authorization.

Scrambling: Encoding a TV picture or other transmission so it cannot be viewed without a special device to decode the signal.

SECA: See Southern Educational Communications Association.

Second Audio Program: A subcarrier over which television stations equipped to transmit in stereo may also use an audio channel to transmit separate audio programming, data, and slow-scan video signals that can be picked up by especially equipped receivers.

Slow Scan TV: See Freeze Frame TV.

Studio: Comprehensive video production facility, including broadcast quality capabilities. Can be configured in many different types of video production uses. May or may not have video origination ability.

Southern Educational Communications Association (SECA): A regional association of educational radio and television stations which serves to develop and share information and resources of its members.

Subcarrier: See Subsidiary Communications Authorization.

Subsidiary Communications Authorization (SCA/Subcarrier): FCC permission granted to a radio station to use subcarriers in the FM channel for separate audio or data services. SCA can be used to deliver "Muzak," data, and reading programs for the blind and the physically handicapped.

Teleconferencing: Electronic communication among three or more people in separate locations generally via telephone, video, or computers.

Teleconferencing Origination Center: A facility specifically designed for originating events in a training or meeting setting. Has limited production capability.

Teleconferencing Receive Center: A room equipped to receive (only) audio or video programming. Similar to an electronic receive classroom.

Telecourses: Usually videotaped higher education courses for distribution by broadcast or cable.

Teletext: A system that transmits text and graphics to TV sets equipped with decoders which allow users to select individual pages of information.

Translator: A low-powered transmitter that retransmits the signal of a distant TV or radio station in an area with poor reception.

Transponder: "Channel" on a satellite that receives, amplifies, and retransmits audio, video, and data signals sent from uplinks.

TVRO: Television Receive Only: satellite downlinks.

UHF: See Ultra High Frequency.

Ultra High Frequency (UHF): 470 - 890 megahertz, television channels 14-69. More limited area of coverage than VHF with the same power.

Uplink: An earth station that sends (uplinks) a signal to a satellite. An uplink can also have a built-in downlink to receive signals from a satellite.

VAPTS: See Virginia Association of Public Television Stations.

VBI: See Vertical Blanking Interval.

VCR: See Videocassette Recorder.

Vertical Blanking Interval (VBI): Twenty-one lines in the TV signal that transmit encoded infomration. One use is closed captioning for the hearing-impaired.

Very High Frequency (VHF): 54 - 216 megahertz, television channels 2-13. Commercial television channels usually operate on these frequencies.

VHF: See Very High Frequency.

VHS: See Video Home System.

Video Home System (VHS): The most popular of the two videocassette formats using half-inch tape. The other is Beta.

Videocassette Recorder (VCR): A videocassette recorder (and player).

Videodisc: A hard disc that stores information in "pits" indented into the surface; provides a high-capacity, rapid access storage medium of over 50,000 frames of information.

Videotape: Medium for recording video images widely used for promotional, entertainment, and educational purposes.

Videotext: A system for delivery of graphic and text material by electronic means (broadcast, CATV, telephone lines, etc.) for display on especially-equipped television sets.

Virginia Association of Public Television Stations (VAPTS): A membership organization representing public television stations owned and operated by four private, nonprofit public telecommunciations organizations incorporated in Virginia.

Virginia Public Radio Association (VPRA): A membership organization representing public radio stations located in Virginia.

VIVID: An experimental, closed-circuit video teleconferencing system installed in four state buildings in downtown Richmond under the direction of the DIT Division of Educational Technology, C&P Telephone and AT&T.

VPRA: See Virginia Public Radio Association.

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